

Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of forming an anti-microbial wiper capable of providing liquid anti-microbial solution after multiple rinse cycles, the method comprising the steps of:

providing a controlled release anti-microbial formulation comprising an anti-microbial agent and a cross-linked polymer mixture selected from the group consisting of acrylates, styrene butadiene, vinyl chlorides, methacrylates, acrylics, and vinyl acetates, and mixtures thereof; and

adhering said formulation to an absorbent web containing fibers, which web retains liquid after each rinse cycle, and which formulation releases sufficient anti-microbial agent into the retained liquid after each of at least five normal rinse cycles so that the retained liquid is an anti-microbial solution and said retained liquid is capable of disinfecting a hard surface that is wiped with said anti-microbial wiper.

2. (cancelled) ~~A method as defined in claim 1, wherein said anti-microbial formulation comprises a polymer or a polymer mixture.~~

3. (currently amended) A method as defined in claim 21, wherein said cross-linked polymer mixture comprises a water-swellable polymer such that the degree of swelling of said water-swellable polymer at least partially controls said release of said anti-microbial agent.

4. (currently amended) A method as defined in claim 23, wherein said cross-linked polymer mixture is a latex adhesive.

5. (canceled) A method as defined in claim 4, wherein said latex adhesive is capable of becoming cross-linked.

6. (original) A method as defined in claim 1, wherein said anti-microbial formulation comprises a source of anti-microbial ions.

7. (original) A method as defined in claim 6, wherein said source of anti-microbial metal ions are selected from the group consisting of silver, copper, zinc, mercury, antimony, lead, bismuth, cadmium, chromium and thallium.

8. (original) A method as defined in claim 7, wherein said metal is silver.

9. (original) A method as defined in claim 1, wherein said anti-microbial formulation comprises a source of free chlorine.

10. (original) A method as defined in claim 1, wherein said anti-microbial formulation comprises calcium hypochlorite particles.

11. (original) A method as defined in claim 1, wherein said anti-microbial comprises a quaternary ammonium compound.

12. (original) A method as defined in claim 11, wherein said quaternary ammonium compound is alkyl aryl benzalkonium chloride.

13. (currently amended) A method as defined in claim 21, wherein said polymer or cross-linked polymer mixture further comprises an additive selected from the group consisting of a cross-linking agent, a catalyst, a thickener, a plasticizer, a defoamer, a

colorant, a visual sensor, a pigment, composite particles, a viscosity modifier, a stabilizer, a surfactant, and combinations thereof.

14. (original) A method as defined in claim 1, wherein the adhering of said anti-microbial formulation comprises spraying the anti-microbial formulation onto said absorbent web.

15. (original) A method as defined in claim 1, wherein the adhering of said anti-microbial formulation comprises printing the anti-microbial formulation onto said absorbent web.

16. (original) A method as defined in claim 1, wherein said absorbent web has at least two surfaces, said anti-microbial formulation being applied to said at least one of said two surfaces of said absorbent web in a pre-selected pattern.

17. (original) A method as defined in claim 16, wherein said anti-microbial formulation covers from about 10% to about 60% of said at least one surface of said absorbent web.

18. (original) A method as defined in claim 1, wherein said anti-microbial formulation covers from about 20% to about 40% of said at least one surface of said absorbent web.

19. (original) A method as defined in claim 16, wherein said anti-microbial formulation covers from about 10% to about 60% of both surfaces of said absorbent web.

20. (currently amended) A method as defined in claim 1 2, further comprising the step of curing said polymer mixture after said anti-microbial formulation has been applied to said absorbent web.

21. (original) A method as defined in claim 16, further comprising the step of creping said at least one surface of said absorbent web to soften said absorbent web after said anti-microbial formulation has been applied to said absorbent web.

22. (original) A method as defined in claim 1, wherein said fibers of said absorbent web comprise pulp fibers.

23. (original) A method as defined in claim 1, wherein said fibers of said absorbent web comprise synthetic fibers.

24. (currently amended) A method of forming an anti-microbial wiper for disinfecting hard surfaces comprising the steps of:

providing an absorbent base web containing fibers and capable of retaining liquid after a rinse cycle, said absorbent web having two outer surfaces; and
adhering an anti-microbial formulation to said absorbent web, said anti-microbial formulation comprising an anti-microbial agent and a polymer or cross-linked polymer mixture selected from the group consisting of acrylates, styrene butadiene, vinyl chlorides, methacrylates, acrylics, and vinyl acetates, and mixtures thereof, said anti-microbial formulation containing an anti-microbial agent being capable of activation when said absorbent web is contacted with a liquid, said activation including the release of a portion of said anti-microbial agent into the retained liquid to form an anti-microbial solution, said polymer mixture being capable of controlling the rate of release of the anti-microbial agent from the anti-microbial formulation so that said anti-microbial solution is formed after at least five rinse cycles and said retained liquid is capable of disinfecting a hard surface that is wiped with said anti-microbial wiper.

25. (currently amended) A method as defined in claim 24, wherein said cross-linked polymer mixture comprises an additive selected from the group consisting of a cross-linking agent, a catalyst, a thickener, a plasticizer, a defoamer, a colorant, a visual sensor, a pigment, composite particles, a viscosity modifier, a stabilizer, a surfactant, and combinations thereof.

26. (currently amended) A wiper capable of providing liquid anti-microbial solution after numerous rinse cycles comprising:

a controlled release anti-microbial formulation comprising an anti-microbial agent and a polymer or cross-linked polymer mixture selected from the group consisting of acrylates, styrene butadiene, vinyl chlorides, methacrylates, acrylics, and vinyl acetates, and mixtures thereof, which formulation is adhered to

an absorbent web which retains liquid after each rinse cycle, which anti-microbial formulation releases sufficient anti-microbial agent into the retained liquid after each of at least five normal rinse cycles so that the retained liquid is an anti-microbial solution and said retained liquid is capable of disinfecting a hard surface that is wiped with said anti-microbial wiper.

27. (cancelled) A wiper as defined in claim 26, wherein said anti-microbial formulation comprises an antimicrobial agent and a polymer.

28. (currently amended) A wiper as defined in claim 26, wherein said polymer mixture is a latex adhesive.

29. (canceled) A method as defined in claim 28, wherein said latex adhesive is capable of becoming cross-linked.

30. (original) A wiper as defined in claim 26, wherein said source of anti-microbial metal ions are selected from the group consisting of silver, copper, zinc, mercury, antimony, lead, bismuth, cadmium, chromium and thallium.

31. (original) A wiper as defined in claim 30, wherein said metal is silver.

32. (original) A wiper as defined in claim 26, wherein said anti-microbial formulation comprises a source of free chlorine.

33. (original) A wiper as defined in claim 26, wherein said anti-microbial formulation comprises a source of chlorine dioxide.

34. (original) A wiper as defined in claim 32, wherein said anti-microbial formulation comprises calcium hypochlorite particles.

35. (original) A wiper as defined in claim 26, wherein said anti-microbial formulation comprises a quaternary ammonium compound.

36. (original) A wiper as defined in claim 28, wherein said quaternary ammonium compound is alkyl aryl benzalkonium chloride.

37. (currently amended) A wiper as defined in claim 27, wherein said polymer mixture further comprises an additive selected from the group consisting of a cross-linking agent, a catalyst, a thickener, a plasticizer, a defoamer, a colorant, a visual sensor, a pigment, composite particles, a viscosity modifier, a stabilizer, a surfactant, and combinations thereof.

38. (original) A wiper as defined in claim 26, wherein said anti-microbial formulation covers from about 10% to about 60% of said at least one surface of said absorbent web.

39. (original) A wiper as defined in claim 26, wherein said anti-microbial formulation covers from about 20% to about 40% of said at least one surface of said absorbent web.

40. (original) A wiper as defined in claim 26, wherein said anti-microbial formulation covers from about 10% to about 60% of both surfaces of said absorbent web.

41. (original) A wiper as defined in claim 26, wherein said fibers of said absorbent web comprise pulp fibers.

42. (original) A wiper as defined in claim 26, wherein said fibers of said absorbent web comprise synthetic fibers.